AMENDMENTS TO THE CLAIMS

Please amend the claims as presented below in the Listing of Claims. This Listing of Claims will replace all prior versions and listings of claims in this application.

Listing of Claims

1-102. (Cancelled)

103. (Cancelled) A channel structure for a wireless multiple-access multiple-input multiple-output (MIMO) communication system, comprising:

a broadcast channel for transmitting, on a downlink, system parameters and a pilot used for channel estimation of the downlink;

a forward control channel for transmitting, on the downlink, a schedule for data transmission on the downlink and an uplink;

a forward channel for transmitting traffic data on the downlink;

a random access channel for transmitting, on the uplink, user requests to access the system; and

a reverse channel for transmitting traffic data on the uplink.

104. (Cancelled) The channel structure of claim 103, wherein the broadcast channel, forward control channel, forward channel, random access channel, and reverse channel are time division multiplexed within a frame having a predetermined time duration.

105. (Cancelled) The channel structure of claim 104, wherein the broadcast channel is transmitted first and the forward control channel is transmitted second in the frame.

106. (Cancelled) The channel structure of claim 103, wherein the broadcast channel and the forward control channel are transmitted using a diversity mode supporting data transmission with redundancy from a plurality of transmit antennas.

107. (Cancelled) The channel structure of claim 103, wherein the forward channel and the

reverse channel support a diversity mode and a spatial multiplexing mode, the diversity mode supporting data transmission with redundancy from a plurality of transmit antennas, and the spatial multiplexing mode supporting data transmission on a plurality of spatial channels.

108. (Cancelled) The channel structure of claim 103, wherein the random access channel supports a single-input multiple-output (SIMO) mode and a beam-steering mode, the SIMO mode supporting data transmission from a single transmit antenna to multiple receive antennas, and the beam-steering mode supporting data transmission on a single spatial channel associated with a highest rate among a plurality of spatial channels.

109. (Cancelled) The channel structure of claim 103, wherein the forward channel and the reverse channel each has a variable time duration.

110. (Cancelled) The channel structure of claim 103, wherein the forward control channel and the random access channel each has a variable time duration.

111. (Cancelled) The channel structure of claim 103, wherein the schedule includes identities of user terminals scheduled for data transmission on the downlink and uplink.

112. (Cancelled) The channel structure of claim 103, wherein the schedule includes a transmission mode and at least one rate for each user terminal scheduled for data transmission on the downlink and uplink, the transmission mode being selected from among a plurality of transmission modes supported by the system, and each of the at least one rate being selected from among a plurality of rates supported by the system.

113. (Cancelled) The channel structure of claim 103, wherein the forward channel is further for transmitting a steered pilot on at least one eigenmode of the downlink for a user terminal.

114. (Cancelled) The channel structure of claim 103, wherein the reverse channel is further for transmitting on the uplink a second pilot used for channel estimation of the uplink.

115. (Cancelled) The channel structure of claim 103, wherein the reverse channel is further for transmitting a steered pilot on at least one eigenmode of the uplink from a user terminal.

116. (Original) An apparatus in a wireless multiple-access multiple-input multiple-output (MIMO) communication system, comprising:

a transmit data processor operative to

process system parameters and a pilot for transmission via a broadcast channel, wherein the pilot is used for channel estimation of the downlink,

process scheduling information for transmission via a forward control channel, wherein the scheduling information is for data transmission on the downlink and an uplink, and

process traffic data for transmission via a forward channel; and

a receive data processor operative to

process user requests received via a random access channel, and

process traffic data received via a reverse channel.

117. (Original) The apparatus of claim 116, wherein the broadcast channel, forward control channel, forward channel, random access channel, and reverse channel are time division multiplexed within a frame having a predetermined time duration.

118. (Original) The apparatus of claim 116, wherein the broadcast channel and the forward control channel are transmitted using a diversity mode supporting data transmission with redundancy from a plurality of transmit antennas.

119. (Original) The apparatus of claim 116, wherein the forward channel and the reverse channel support a diversity mode and a spatial multiplexing mode, the diversity mode supporting data transmission with redundancy from a plurality of transmit antennas, and the spatial multiplexing mode supporting data transmission on a plurality of spatial channels.

120. (Original) The apparatus of claim 116, wherein the random access channel supports a single-input multiple-output (SIMO) mode and a beam-steering mode, the SIMO mode supporting data transmission from a single transmit antenna to multiple receive antennas, and the beam-steering mode supporting data transmission on a single spatial channel associated with a highest rate among a plurality of spatial channels.

121. (Original) An apparatus in a wireless multiple-access multiple-input multiple-output (MIMO) communication system, comprising:

means for processing system parameters and a pilot for transmission via a broadcast channel, wherein the pilot is used for channel estimation of the downlink;

means for processing scheduling information for transmission via a forward control channel, wherein the scheduling information is for data transmission on the downlink and an uplink;

means for processing traffic data for transmission via a forward channel;

means for processing user requests received via a random access channel; and

means for processing traffic data received via a reverse channel.

122. (Currently Amended) The ~~channel structure~~ apparatus of claim 121, wherein the broadcast channel, forward control channel, forward channel, random access channel, and reverse channel are time division multiplexed within a frame having a predetermined time duration.

123. (Currently Amended) The ~~channel structure~~ apparatus of claim 121, wherein the broadcast channel and the forward control channel are transmitted using a diversity mode supporting data transmission with redundancy from a plurality of transmit antennas.

124. (Currently Amended) The ~~channel structure~~ apparatus of claim 121, wherein the forward channel and the reverse channel support a diversity mode and a spatial multiplexing mode, the diversity mode supporting data transmission with redundancy from a plurality of transmit antennas, and the spatial multiplexing mode supporting data transmission on a plurality of spatial channels.

125. (Currently Amended) The ~~channel structure~~ apparatus of claim 121, wherein the random access channel supports a single-input multiple-output (SIMO) mode and a beam-steering mode, the SIMO mode supporting data transmission from a single transmit antenna to multiple receive antennas, and the beam-steering mode supporting data transmission on a single spatial channel associated with a highest rate among a plurality of spatial channels.

126. (Original) A method of transmitting signaling information in a wireless multiple-input multiple-output (MIMO) communication system, comprising:

transmitting signaling information for a first set of at least one user terminal at a first rate on a first subchannel of a forward control channel; and

transmitting signaling information for a second set of at least one user terminal at a second rate on a second subchannel of the forward control channel, wherein the second rate is higher than the first rate, and wherein the second subchannel is transmitted after the first subchannel.

127. (Original) The method of claim 126, further comprising:

transmitting signaling information for a third set of at least one user terminal at a third rate on a third subchannel of the forward control channel, wherein the third rate is higher than the second rate, and wherein the third subchannel is transmitted after the second subchannel.

128. (Original) The method of claim 126, wherein the first subchannel indicates whether or not the second subchannel is transmitted in a current frame.

129. (Original) An apparatus in a wireless multiple-input multiple-output (MIMO) communication system, comprising:

a transmit data processor operative to

process signaling information for a first set of at least one user terminal based on a first rate, and

process signaling information for a second set of at least one user terminal based on a second rate that is higher than the first rate; and

a transmitter unit operative to

transmit the processed scheduling information for the first user terminal set on a first subchannel of a forward control channel, and

transmit the processed scheduling information for the second user terminal set on a second subchannel of the forward control channel, wherein the second subchannel is transmitted after the first subchannel.

130. (Original) The apparatus of claim 129, wherein the transmit data processor is further operative to process signaling information for a third set of at least one user terminal based on a

third rate that is higher than the second rate, and wherein the transmitter unit is further operative to transmit the processed signaling information for the third user terminal set on a third subchannel of the forward control channel, wherein the third subchannel is transmitted after the second subchannel.

131. (Original) The apparatus of claim 129, wherein the first subchannel indicates whether or not the second subchannel is transmitted in a current frame.

132. (Original) An apparatus in a wireless multiple-input multiple-output (MIMO) communication system, comprising:

means for transmitting signaling information for a first set of at least one user terminal at a first rate on a first subchannel of a forward control channel; and

means for transmitting signaling information for a second set of at least one user terminal at a second rate on a second subchannel of the forward control channel, wherein the second rate is higher than the first rate, and wherein the second subchannel is transmitted after the first subchannel.

133. (Original) The apparatus of claim 132, further comprising:

means for transmitting signaling information for a third set of at least one user terminal at a third rate on a third subchannel of the forward control channel, wherein the third rate is higher than the second rate, and wherein the third subchannel is transmitted after the second subchannel.

134. (Original) The apparatus of claim 132, wherein the first subchannel indicates whether or not the second subchannel is transmitted in a current frame.

135. (Original) A method of receiving signaling information at a user terminal in a wireless multiple-input multiple-output (MIMO) communication system, comprising:

receiving signaling information sent at a first rate on a first subchannel of a forward control channel; and

if signaling information for the user terminal is not obtained from the first subchannel, receiving signaling information sent at a second rate on a second subchannel of the forward control

channel, wherein the second rate is higher than the first rate, and wherein the second subchannel is sent after the first subchannel.

136. (Original) The method of claim 126, further comprising:

if signaling information for the user terminal is not obtained from the second subchannel, receiving signaling information sent at a third rate on a third subchannel of the forward control channel, wherein the third rate is higher than the second rate, and wherein the third subchannel is sent after the second subchannel.

137. (Original) The method of claim 126, further comprising:

terminating processing of the forward control channel upon encountering decoding failure for a subchannel of the forward control channel.

138. (Original) An apparatus in a wireless multiple-input multiple-output (MIMO) communication system, comprising:

a receive data processor operative to

receive signaling information sent at a first rate on a first subchannel of a forward control channel, and

if signaling information for the apparatus is not obtained from the first subchannel, receiving signaling information sent at a second rate on a second subchannel of the forward control channel, wherein the second rate is higher than the first rate, and wherein the second subchannel is sent after the first subchannel; and

a controller operative to direct the processing for the first and second subchannels.

139. (Original) The apparatus of claim 138, wherein the receive data processor is further operative to, if signaling information for the apparatus is not obtained from the second subchannel, receive signaling information sent at a third rate on a third subchannel of the forward control channel, wherein the third rate is higher than the second rate, and wherein the third subchannel is sent after the second subchannel.

140. (Original) The apparatus of claim 138, wherein the controller is further operative to

terminate processing of the forward control channel upon encountering decoding failure for a subchannel of the forward control channel.

141. (Original) An apparatus in a wireless multiple-input multiple-output (MIMO) communication system, comprising:

means for receiving signaling information sent at a first rate on a first subchannel of a forward control channel; and

means for, if signaling information for the apparatus is not obtained from the first subchannel, receiving signaling information sent at a second rate on a second subchannel of the forward control channel, wherein the second rate is higher than the first rate, and wherein the second subchannel is sent after the first subchannel.

142. (Original) The apparatus of claim 141, further comprising:

means for, if signaling information for the apparatus is not obtained from the second subchannel, receiving signaling information sent at a third rate on a third subchannel of the forward control channel, wherein the third rate is higher than the second rate, and wherein the third subchannel is sent after the second subchannel.

143. (Original) The apparatus of claim 141, further comprising:

means for terminating processing of the forward control channel upon encountering decoding failure for a subchannel of the forward control channel.

144–216. (Cancelled)

217. (Previously Presented) A computer-program product for a wireless multiple-access multiple-input multiple-output (MIMO) communication system comprising a computer readable medium having a set of instructions stored thereon, the set of instructions being executable by one or more processors and the set of instructions comprising:

instructions for processing system parameters and a pilot for transmission via a broadcast channel, wherein the pilot is used for channel estimation of the downlink;

instructions for processing scheduling information for transmission via a forward control

channel, wherein the scheduling information is for data transmission on the downlink and an uplink;

instructions for processing traffic data for transmission via a forward channel;

instructions for processing user requests received via a random access channel; and

instructions for processing traffic data received via a reverse channel.

218. (Previously Presented) The computer-program product of claim 217, wherein the broadcast channel, forward control channel, forward channel, random access channel, and reverse channel are time division multiplexed within a frame having a predetermined time duration.

219. (Previously Presented) The computer-program product of claim 217, wherein the broadcast channel and the forward control channel are transmitted using a diversity mode supporting data transmission with redundancy from a plurality of transmit antennas.

220. (Previously Presented) The computer-program product of claim 217, wherein the forward channel and the reverse channel support a diversity mode and a spatial multiplexing mode, the diversity mode supporting data transmission with redundancy from a plurality of transmit antennas, and the spatial multiplexing mode supporting data transmission on a plurality of spatial channels.

221. (Previously Presented) The computer-program product of claim 217, wherein the random access channel supports a single-input multiple-output (SIMO) mode and a beam-steering mode, the SIMO mode supporting data transmission from a single transmit antenna to multiple receive antennas, and the beam-steering mode supporting data transmission on a single spatial channel associated with a highest rate among a plurality of spatial channels.

222. (Previously Presented) A computer-program product for transmitting signaling information in a wireless multiple-input multiple-output (MIMO) communication system comprising a computer readable medium having a set of instructions stored thereon, the set of instructions being executable by one or more processors and the set of instructions comprising:

instructions for receiving signaling information sent at a first rate on a first subchannel of a forward control channel; and

instructions for, if signaling information for the apparatus is not obtained from the first subchannel, receiving signaling information sent at a second rate on a second subchannel of the forward control channel, wherein the second rate is higher than the first rate, and wherein the second subchannel is sent after the first subchannel.

223. (Previously Presented) The computer-program product of claim 222, further comprising:

instructions for, if signaling information for the apparatus is not obtained from the second subchannel, receiving signaling information sent at a third rate on a third subchannel of the forward control channel, wherein the third rate is higher than the second rate, and wherein the third subchannel is sent after the second subchannel.

224. (Previously Presented) The computer-program product of claim 222, further comprising:

instructions for terminating processing of the forward control channel upon encountering decoding failure for a subchannel of the forward control channel.